IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	:	10/802,853	Confirmation No. 5857
Applicant	:	KODAMA, S.	
Filed	:	March 18, 2004	
Title	:	DATA WRITE PROTECTION IN A STORAGE AREA NETWORK AND NETWORK ATTACHED STORAGE MIXED ENVIRONMENT	
TC/AU	:	2164	
Examiner	:	A.M. Lewis	
Docket No.	:	274.43202X00	
Customer No.:		24956	

Commissioner for Patents
Mail Stop Amendment
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION UNDER 37 CFR 1.131

I, Shoji Kodama, declare the following:

(1) That I am the sole inventor of the invention described and disclosed in the above-identified U.S. patent application (Serial No. 10/802,853).

(2) That the invention was conceived prior to November 3, 2003.

(3) That I disclosed the invention in an Invention Disclosure document (Exhibit A) prior to November 3, 2003 and that the Invention Disclosure document includes support for the claims of the above-identified U.S. patent application. The dates identified on Exhibit A have been redacted.

(4) That I conceived of the invention prior to November 3, 2003, as evidenced by Exhibit A, and there was due diligence from prior to November 3, 2003 to the filing date of March 18, 2004 of the above identified US application.

(5) I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are

believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

児玉 昇司

Shoji Kodama

Aug 8th, 2008

Date

APPENDIX A

I. Problem Solved by the Invention

Direction: Briefly describe the problem solved by this invention or the requirement that led to the invention. Discuss the need for the invention, and identify the problems of the closest prior technology that the invention solves.

(1) Regulations, Long Term Data Archiving and WORM

(A) Backgrounds and Requirements

(a) Regulations and Long Term Data Archiving

- Regulations like SEC (Securities and Exchange Act) and 21 CFR (Code of Federal Regulations) Part 11 of Food and Drug Administration require regulated companies to keep data for a long term.
- The data must not be changed during the retention period. As the result, the data need to be stored on WORM (Write Once Read Many) media.

(b) LDEV Guard

- Disk subsystems like HDS's Lightning have WORM capability called LDEV Guard. With this capability, if a volume is set to be PROTECTED, no one can write or change any data stored on the volume.
- Because data need not to be kept after an expiration of a period required by a regulation, LDEV guard provides a retention period for a volume. After an expiration of the retention period, users can write and change data on the volume. The storage system has an internal timer for this purpose.

(c) Strict WORM

- Some regulations require WORM setting can't be altered by anyone in the world. As same as this, the retention period or the internal timer in the storage system can't be altered also.

(d) Protect Data at File Level

- Data is archived at file level. So it's the best to protect data at file level. NAS (Network Attached Storage) fits to this requirement. Some NAS products have WORM capability.

(e) Manipulate Data at Volume Level

- When data is copied, moved, or backed up, it's better to move data by using faster and lower overhead network. Fibre Channel RAID storage system products provide this.

(B) Problems

(a) Inconsistent Requirements

- Protecting data at file level and manipulating data at volume level are inconsistent requirements.
- NAS gateway provides file-level access and file-level data protection via the NAS gateway and volume-level access to a FC storage system by passing the NAS gateway. But accessing data though a Fibre Channel network or a SAN can alter the protected data and this doesn't' meet to WORM requirement.

(b) LDEV Guard is Difficult to Use

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- LDEV guard provides data protection at volume level. Users or archiving software vendors need to develop software that manages volumes and locations of archived data on the volumes. It's better that storage systems provides these capabilities and users or vendors doesn't care about them. They can have useful interface like storing and protecting data at file level.

II. Summary of the Invention

Direction: Summarize the invention in general terms. State the novel feature(s) of the invention which solve(s) the problem(s) identified in Section I. Set forth the basic idea of the invention.

Embodiment 1
Storage system
provides two types of interfaces, the first interface for file level I/O and the second interface for block level I/O
manages a pool of physical volumes and creates appropriate size of a file system to store archived data
In the storage system
the first controller processes file level I/O requests and the second controller processes block level I/O requests
the first controller and the second controller shares protection information for logical volumes and physical volumes in the storage system
Archived data
is stored from the first interface and protected at file system level
is accessed from both the first interface and the second interface
is protected whichever interfaces are used
Users can create appropriate size of a file system to store the archived data
where the file system consists of multiple physical volumes

Embodiment 2
Storage system
provides the second interface for block level I/O
has protection information for physical volumes in the storage system
NAS gateway
provides the first interface for file level I/O
manages a pool of physical volumes in the storage system and creates appropriate size of a file system to store archived data
Storage system and NAS gateway are connected via the third interface
Archived data
is stored from the first interface. NAS gateway stores received data via the first interface to physical volumes in the storage system via the third interface

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is protected at file system level. NAS gateway asks the storage system to protect physical volumes that construct a file system to be protected
is accessed from both the first interface and the second interface
is protected for whichever interfaces are used

III. Prior Art

Direction: Discuss any prior art or previous approach to the solution of the problem known to the inventor, including disadvantages and difficulties in past practice. Identify all pertinent literature (e.g., published patents or patent applications, published articles or prior uses) and other public disclosures of which you are aware. Briefly indicate how the invention is different than the listed prior art.

(1) HDS LDEV Guard

(A) HDS's LDEV Guard provides volume-level write protect. It's useful for block-level access but doesn't provide file-level access.

(2) Hitachi ENAS

(A) Hitachi's ENAS provides file-level access to the volume via one interface and block-level access to the same volume via an another interface. ENAS can protect files in the volume at file level but if a server accessed the volume at block-level, there is no write protection for the volume.

(3) HDS NAS Gateway

(A) HDS's NAS Gateway provides file-level access to the volume in the attached storage system and a server can access to the same volume by accessing to the storage system directly. NAS Gateway can protect files in the volume at file level but if a server accessed the volume directly to the storage system, there is no write protection for the volume.

(4) EMC Centera

(A) EMC's Centera provides file-level access to the volume and provides write-protection for archived data. Protected data can't be deleted before retention time is expired. Because Centera provides only file-level access, it can't be accessed via block-level.

(5) EMC Block level guard

(A) EMC's Symmetrix has a block-level write protection but it provides only block-level access.

(6) NetApp SnapLock

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(A) NetApp's FAS provides file-level access and block-level access but the volumes must be different. In a case of file-level access, stored files are protected by SnapLock. SnapLock protects the file system at snapshot basis.

IV. Detailed Description

Direction: Describe the specifics of the invention. Use drawings, flow charts, block diagrams, schematics, tables, formulas, test results, etc. (free from HAL codes and jargon) as appropriate. Provide a written description of each component or step in every figure or flow chart. Include a broad description, preferred embodiments and specific examples. List the advantage(s) over the prior technology that the invention provides.

Embodiment 1 (Figure 1)

(1) A storage system (0107, Figure 1) that has
- (A) One or more first interfaces (0105) for servers (0101a, 0101b) to create, read, write, delete, copy, move and protect files
- (B) one or more logical volumes (0111a, 0111b, 0111c) in which file systems are constructed and files are stored. A logical volume consists of one or more physical volumes. See Figure 2 for relationship between a file system, a logical volume and physical volumes.
- (C) a pool of physical volumes (0113) that are not used for any purpose (free volume pool (0112))
- (D) one or more second interfaces (0106) for servers to read data from logical volumes and physical volumes in the storage system at block level. It is possible that the second interface is physically same as the first interface
- (E) One or more NAS controllers (0108) that provide servers file-level access to the file systems through the first interfaces
- (F) One or more disk controllers (0110) that provide servers block-level access to the logical volumes and physical volumes through the second interfaces
- (G) The NAS controllers and the disk controllers can be physically and logically same or different
- (H) a volume status table (0109) that stores statuses of physical volumes and logical volumes in the storage system and is shared by all of the NAS controllers and the disk controllers in the storage system
- (I) An internal timer (0114) that shows relative time or clock in the storage system

(2) External servers (0101a, 0101b)
- (A) A server is connected to the first interface of the storage system via a LAN (Local Area Network, 0103) or the second interface of the storage system via a SAN (Storage Area Network, 0104). An example of the first interface is Ethernet. An example of the second interface is Fibre Channel. It is possible to use same physical interface for the first interface and the second interface. Ethernet is one example of this. In this case, two types of protocols run on Ethernet, NFS/CIFS protocols for file level I/Os and iSCSI protocol for block level I/Os.

(3) Volume Status Table (Figure 3)
- (A) Volume # column (01091)
  - (a) shows an identification of a volume. A volume can be a logical volume or a physical volume.
- (B) Type column (01092)
  - (a) shows if a volume is a logical volume or a physical volume.

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(C) First status (01093)
(a) shows if a volume is protected or not.
(D) Second status (01094)
(a) shows if a volume is exported or not.
(E) Third status (01095)
(a) shows a retention period of a volume, meaning when the volume can be written again

(4) The NAS controllers
(A) presents the file systems to external servers through the first interfaces
(B) processes the following file I/O requests issued by the external servers via the first interfaces
(a) file create request (Figure 4)
- if the first status of the logical volume of the specified file system is UN-PROTECTED and the file system has enough space to create a file (0401), the NAS controller creates a file into the file system (0402)
- If not, the NAS controller returns an error to the requesting server (0403)

(b) file read request (Figure 5)
- the NAS controller sends the specified file in the specified file system to the requesting server (0501)

(c) file write request (Figure 6)
- if the first status of the logical volume of the specified file system is UN-PROTECTED and the file system has enough space to write data (0601), the NAS controller writes the received data to the specified file (0602)
- if not, the NAS controller returns an error message to the requesting server (0603)

(d) file delete request (Figure 7)
- if the first status of the logical volume of the specified file system is UN-PROTECTED (0701), the NAS controller deletes the specified file from the file system (0702)
- if not, the NAS controller returns an error message to the requesting server (0703)

(e) file copy request (Figure 8)
- if the first status of the logical volume of a target file system is UN-PROTECTED and the target file system has enough space to copy the specified file (0801), the NAS controller copies the specified file in a source file system to the specified location of the target file system (0802)
- if not, the NAS controller returns an error message to the requesting server (0803)

(f) file move request (Figure 9)
- if the first status of the logical volume of a source file system is UN-PROTECTED and the first status of the logical volume of a target file system is UN-PROTECTED and the target file system has enough space to move the specified file (0901), the NAS controller copies the specified file in the source file system to the specified location of the target file system and then the NAS controller deletes the specified file from the source file system (0902)
- if not, the NAS controller returns an error message to the requesting server (0903)

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(g) file-system protect request (Figure 10)

- if the first status of the logical volume of the specified file system is UN-PROTECTED (1001),
  - the NAS controller changes the first status of the logical volume of the specified file system to PROTECTED and sets the sum of the specified retention period and the current internal time to the third status of the logical volume (1002), and
  - the NAS controller changes the first statuses of the physical volumes of the logical volume of the specified file system to PROTECTED and sets the sum of the specified retention period and the current internal time of the NAS controller to the third statuses of the physical volumes (1003).
- if not, the NAS controller returns an error message to the requesting server. (1004)

(h) file-system export request (Figure 11)

- if the request indicates a logical volume (1101), the NAS controller changes the second status of the logical volume of the specified file system to EXPORTED (1102)
- if the request indicates a physical volume, the NAS controller changes the second statuses of the physical volumes of the logical volume of the specified file system to EXPORTED (1103)

(i) file-system un-export request (Figure 12)

- if the request indicates a logical volume (1201), the NAS controller changes the second status of the logical volume of the specified file system to UN-EXPORTED (1202)
- if the request indicates a physical volume, the NAS controller changes the second statuses of the physical volumes of the logical volume of the specified file system to UN-EXPORTED (1203)

(j) file-system create request (Figure 13)

- if the free volume pool has enough number of physical volumes to create a logical volume with the specified size (1301), the NAS controller creates a logical volume with the specified size by using the selected physical volumes and sets the first status of the logical volume to UN-PROTECTED and the second status of the logical volume to UN-EXPORTED (1302). Then the NAS controller creates a file system on the logical volume (1303)
- if not, the NAS controller returns an error to the requesting server (1304)

(k) file-system delete request (Figure 14)

- if the first status of the logical volume of the specified file system is UN-PROTECTED and all of the first status of the physical volumes of the logical volume of the specified file system are UN-PROTECTED (1401), the NAS controller changes the first statuses of the physical volumes of the logical volume of the specified file system to UN-PROTECTED and changes the second statuses of the physical volumes to UN-EXPORTED (1402). If requested so (1403), the NAS

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controller deletes all of data on the physical volumes by shredding (1404). Then the NAS controller puts the physical volumes to the free volume pool (1405).

- if not, the NAS controller returns an error to the requesting server (1406)

(l) file-system expand request (Figure 15)

- if the first status of the logical volume of the specified file system is UN-PROTECTED and the free volume pool has enough number of physical volumes to expand the file system (1501), the NAS controller adds the selected physical volumes to the logical volume of the specified file system (1502) and then expands the size of the file system (1503)
- if not, the NAS controller returns an error to the requesting server (1504)

(D) for all of logical volumes and physical volumes where the first status of the volume is PROTECTED (1601), checks if the third status of the volume is smaller than the current internal time of the storage system (1602). If it is, the NAS controller changes the first status of the volume to UN-PROTECTED and the third status of the volume to zero (1603). It is another implementation that the disk controller does the above processes instead of the NAS controller

(3) The disk controllers

(A) presents logical volumes and physical volumes through the second interfaces if the second statuses of these volumes are EXPORTED.

(B) processes the following block I/O requests issued by the external servers via the second interfaces

(a) data block read request (Figure 17)

- the disk controller reads data in the specified location of the specified logical or physical volume and sends it to the requesting server (1701)

(b) data block write request (Figure 18)

- if the request is for a logical volume (1801), the disk controller checks if the first status of the specified logical volume and the first statuses of physical volumes of the logical volume are UN-PROTECTED (1802). If it is, the disk controller writes the received data to the specified location of the specified logical volume (1803). If not, the disk controller returns an error to the requesting server (1806)
- if the request if for a physical volume, the disk controller checks if the first status of the specified physical volume is UN-PROTECTED (1804). If it is, the disk controller writes the received data to the specified location of the specified physical volume (1805). If not, the disk controller returns an error to the requesting server (1806)

(3) One example of how to archive files (Figure 19)

(A) archives a set of files to the file system of the storage system via the first interface (1901)

(B) expands the size of the file system if the size of the file system is smaller than the amount of the archived files (1902)

(C) protects the file system if the set of the files has been archived (1903)

(D) exports the file system (1904). At this point, external servers can access to the archived files via the second interface

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Embodiment 2 (Figure 20)

(1) A storage system (0107) has
  (A) one or more second interfaces (0106a, 0106b) for providing block-level access to physical volumes (0113a, 0113b, 0113c) in the storage system and setting statuses of the physical volumes in the storage system
  (B) a volume status table (0109b) that stores statuses of physical volumes in the storage system and is shared by all of the disk controllers (0110a, 0110b) in the storage system
  (C) One or more disk controllers that provide block-level access services to servers (0101a, 0101b, 0113) through the second interfaces
  (D) a pool of physical volumes (0113d) that are not used for any purpose (free volume pool, 0112). The free volume pool is managed by NAS gateway (0113)

(2) A NAS gateway (0113) has
  (A) one or more logical volumes in which a file system is constructed and files are stored. A logical volume consists of one or more physical volumes (0113a, 0113b, 0113c) in the storage system. information related to logical volumes and file systems are stored in physical volumes.
  (B) One or more first interfaces (0105) for servers (0101a) to create, read, write, delete, copy, move and protect files
  (C) a volume status table (0109a) that stores statuses of logical volumes in the NAS gateway and is shared by all of the NAS controllers (0108) in the NAS gateway
  (D) one or more fourth interfaces (0106c) to request the storage system reading, writing, shredding and protecting data in the physical volumes in the storage system and setting statuses in volumes in the storage system
  (E) One or more NAS controllers (0108) that provide file-level access services to servers through the first interfaces (0105)

(4) The NAS controllers
  (A) presents the file systems to external servers through the first interfaces
  (B) processes the following file I/O requests issued by the external servers via the first interfaces. For some of file I/O requests, the NAS controller requests data block write request to the storage system via fourth interface. If the NAS controller faced an error return from the storage system, the NAS interrupts the processing file I/O request and sends an error to the requesting server.
    (a) file create request
    (b) file read request
    (c) file write request
    (d) file delete request
    (e) file copy request
    (f) file move request
    (g) file-system protect request
    (h) file-system export request
      - the NAS controller changes the second statuses of the physical volumes of the logical volume of the specified file system to EXPORTED via fourth interface
    (i) file-system un-export request

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- the NAS controller changes the second statuses of the physical volumes of the logical volume of the specified file system to UN-EXPORTED via fourth interface

(k) file-system delete request

- if all of the first statuses of the physical volumes of the logical volume of the specified file system are UN-PROTECTED, the NAS controller changes the first statuses of the physical volumes of the logical volume of the specified file system to UN-PROTECTED and the second statuses of the physical volumes to UN-EXPORTED by using fourth interface. If requested so, the NAS controller deletes all of data on the physical volumes by issuing data shred request to the storage system. Then the NAS controller puts the physical volumes to the free volume pool.

(l) file-system expand request

(3) The disk controllers

(A) presents physical volumes through the second interfaces if the second statuses of these physical volumes are EXPORTED.

(B) processes the following requests issued by the external servers or the NAS gateway via the second interfaces

(a) data block read request

- the disk controller reads data in the specified location of the specified physical volume and sends it to the requesting server

(b) data block write request

- if the first status of the specified physical volume is PROTECTED, the disk controller returns an error to the requesting server. If not, the disk controller writes the received data to the specified physical location of the specified volume

(c) volume status change request

- if the request is an export request, the disk controller changes the second status of specified physical volume to EXPORTED
- if the request is an un-export request, the disk controller changes the second status of specified physical volume to UN-EXPORTED
- if the request is a protect request and the first status of the specified physical volume is UN-PROTECTED, the disk controller changes the first status of the physical volume to PROTECTED

(d) data shred request

- the disk controller deletes data on the specified location of the specified physical volume.

(D) for all of physical volumes where the first status of the physical volume is PROTECTED, checks if the third status of the physical volume is smaller than the current internal time of the storage system. If it is, the disk controller changes the first status of the physical volume to UN-PROTECTED and the third status of the physical volume to zero.

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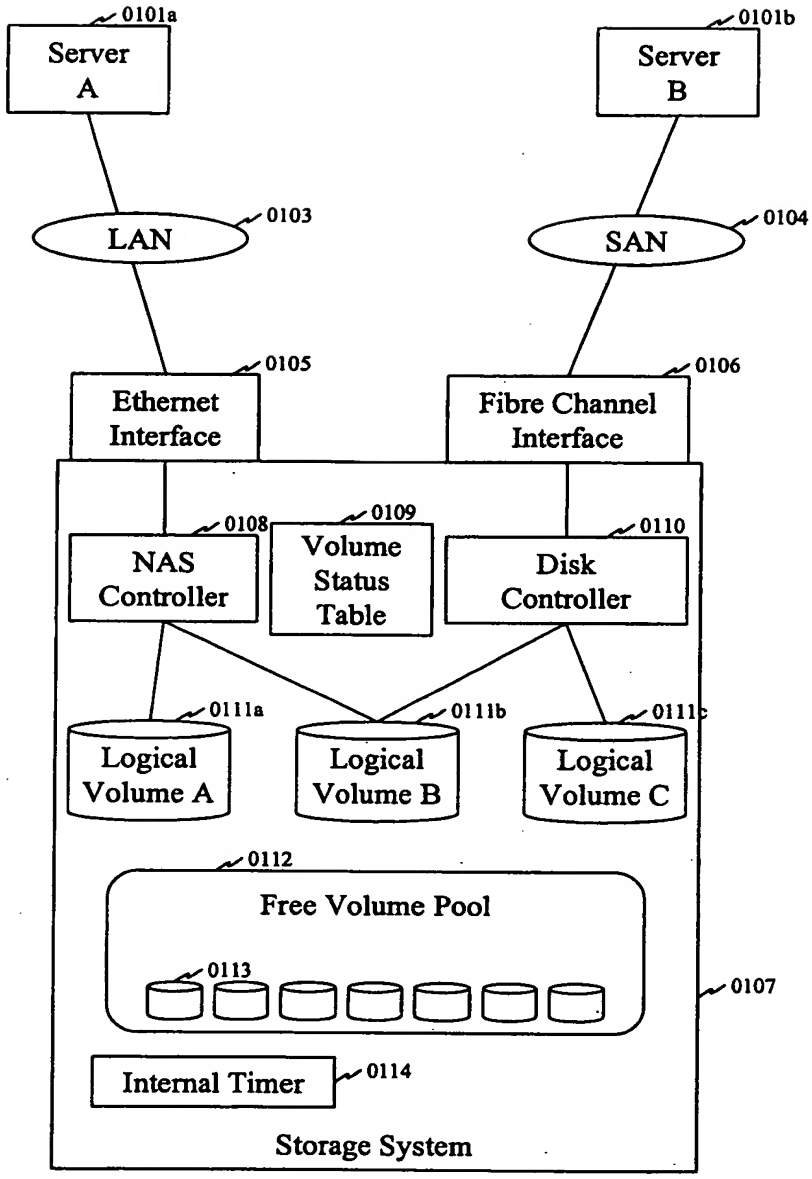

Figure 1: System Diagram

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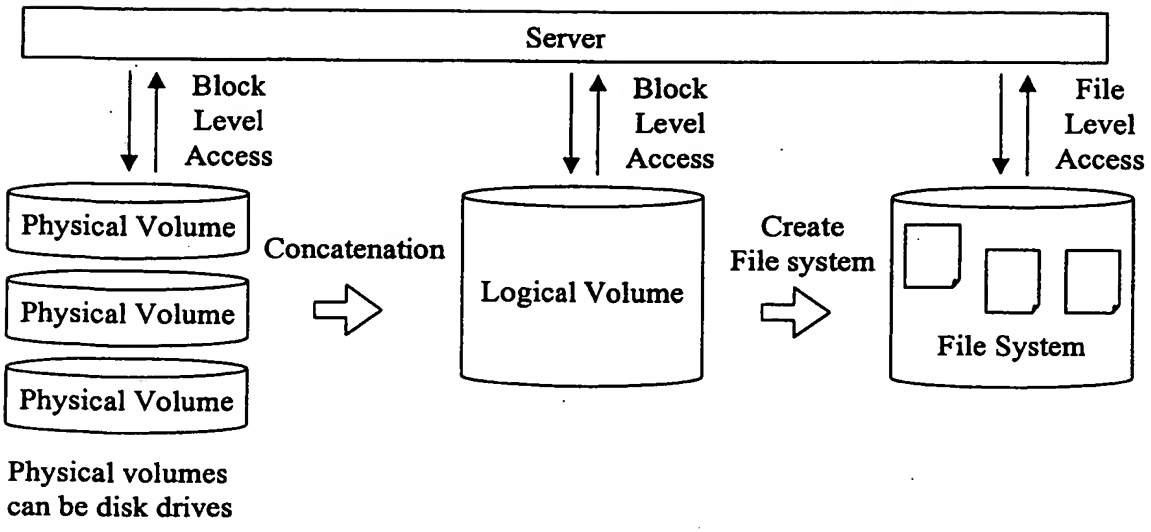

Figure 2: Relationship between physical volumes, logical volume and file system

01091 Volume #	01092 Type	01093 First Status	01094 Second Status	01095 Third Status
0	Logical	PROTECTED	EXPORTED	July 1st, 2004
1	Physical	PROTECTED	EXPORTED	Nov., 28th, 2004
2	Physical	UN-PROTECTED	UN-EXPORTED	
3	Physical	PROTECTED	EXPORTED	Apr., 7th, 2004
4	Logical	UN-PROTECTED	EXPORTED	
5	Logical	UN-PROTECTED	UN-EXPORTED	

Figure 3: Volume Status Table (0109)

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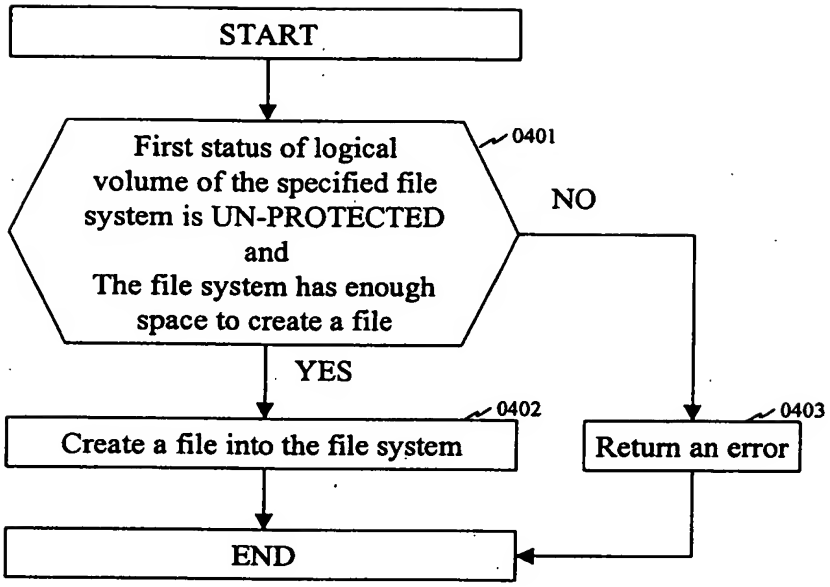

Figure 4: File Create Procedure

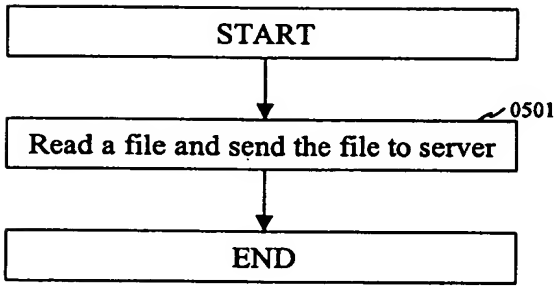

Figure 5: File Read Procedure

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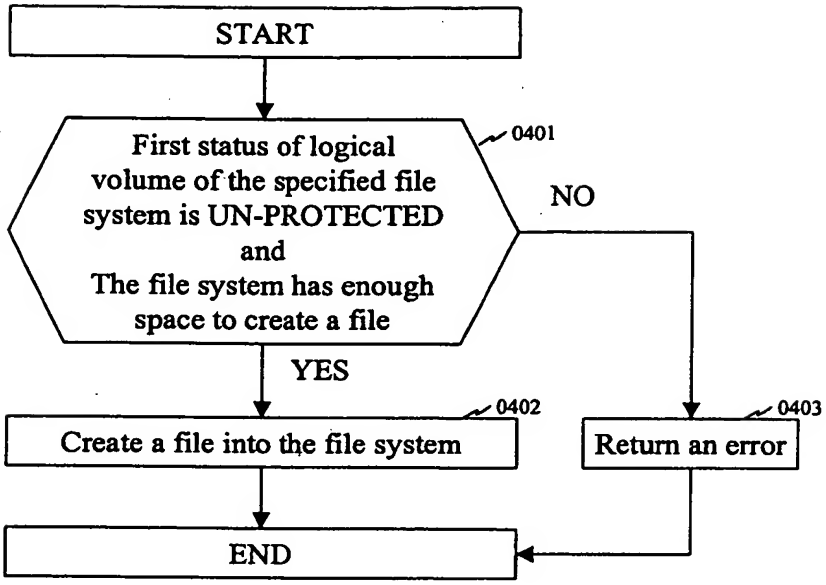

Figure 4: File Create Procedure

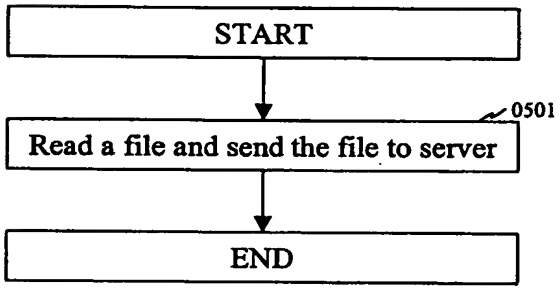

Figure 5: File Read Procedure

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Signature of the Witness (HAL employee ONLY) Date [redacted]	Signature of the Witness (HAL employee ONLY) Date [redacted] Takashi Nakamura

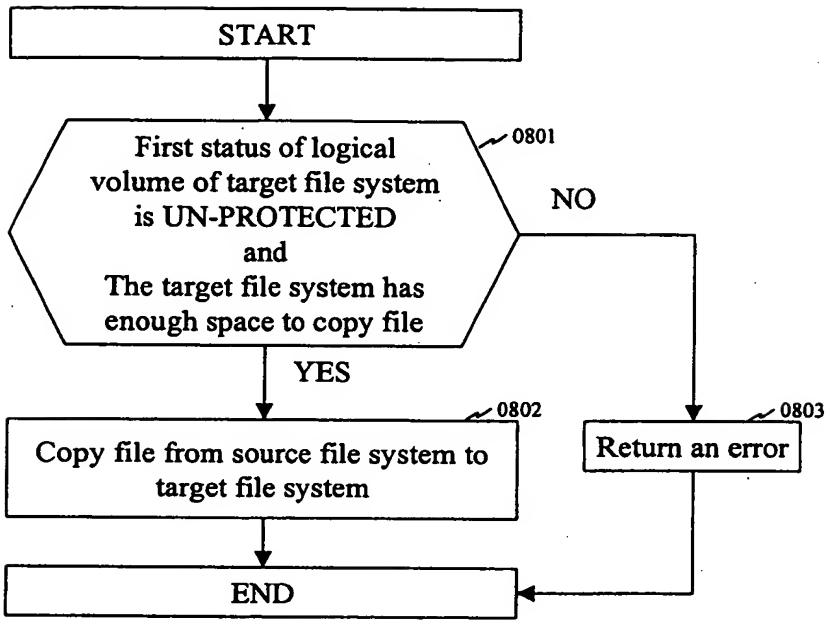

Figure 8: File Copy Procedure

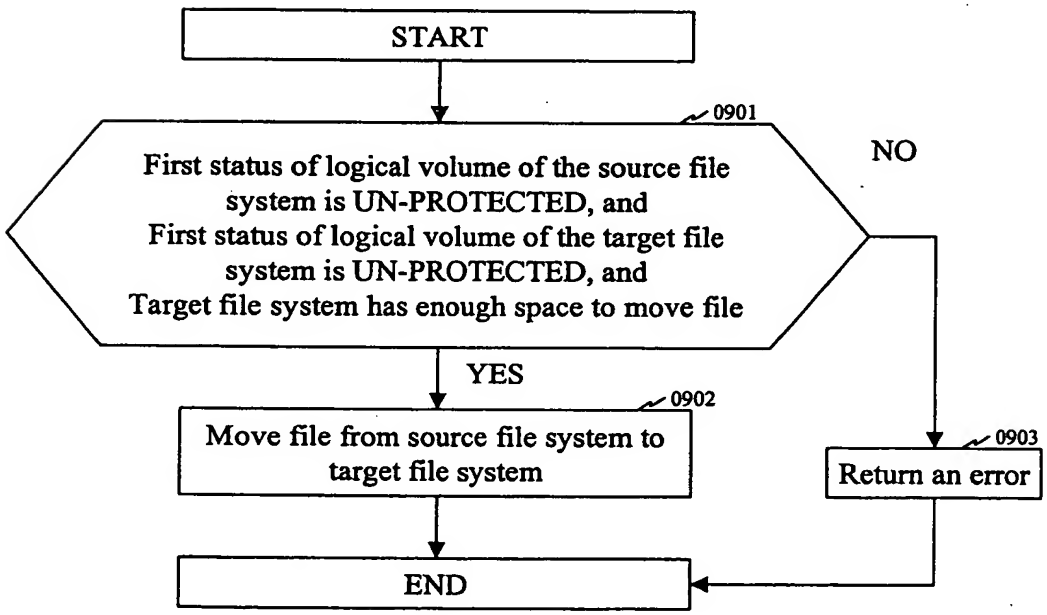

Figure 9: File Move Procedure

Signature of the Inventor (HAL employee ONLY) Date [redacted]	Signature of the Inventor (HAL employee ONLY) Date
Signature of the Inventor (HAL employee ONLY) Date	Signature of the Inventor (HAL employee ONLY) Date
Signature of the Witness (HAL employee ONLY) Date [redacted]	Signature of the Witness (HAL employee ONLY) Date [redacted]

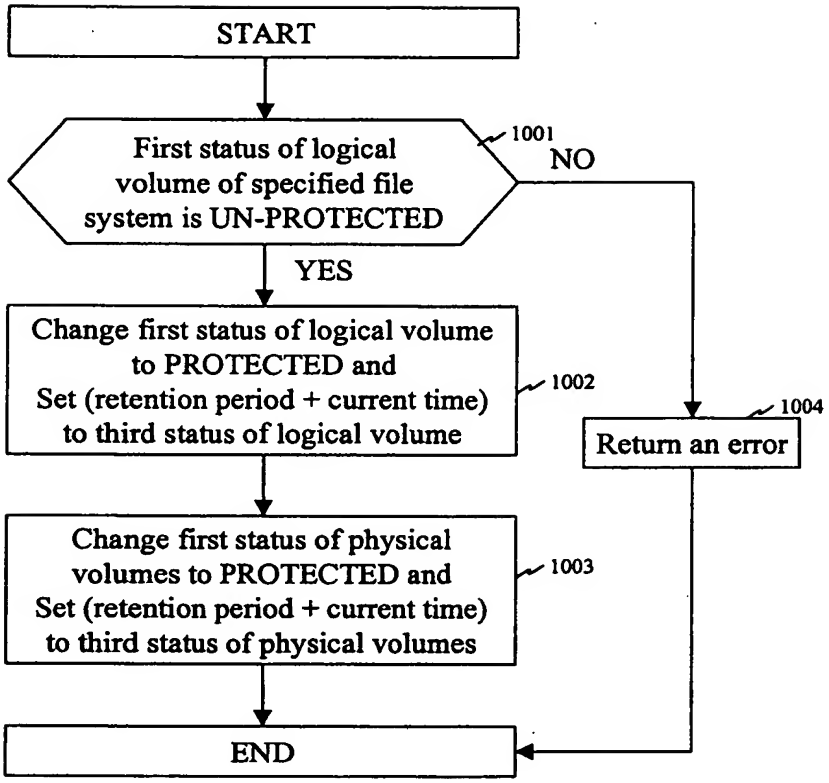

Figure 10: File-System Protect Procedure

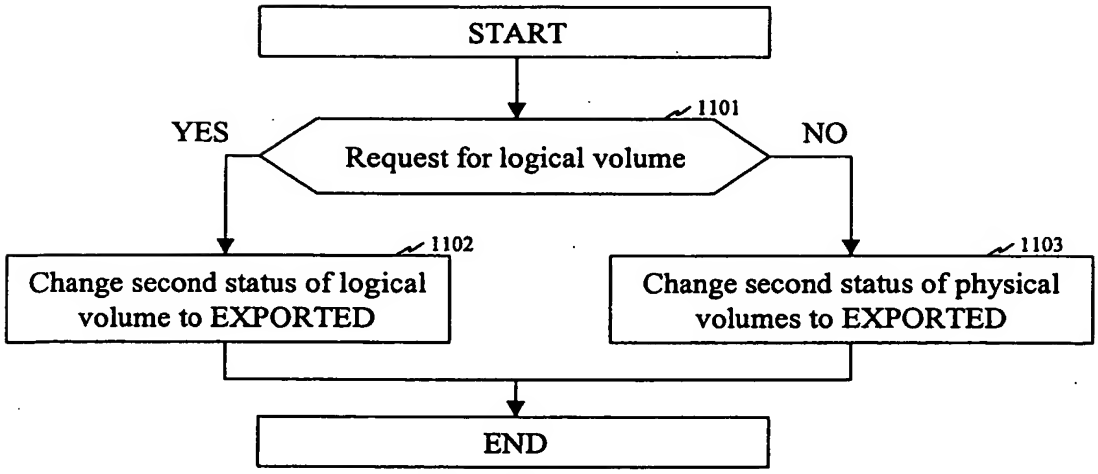

Figure 11: File-System Export Procedure

Signature of the Inventor (HAL employee ONLY) Date [redacted]	Signature of the Inventor (HAL employee ONLY) Date
Signature of the Inventor (HAL employee ONLY) Date	Signature of the Inventor (HAL employee ONLY) Date
Signature of the Witness (HAL employee ONLY) Date [redacted]	Signature of the Witness (HAL employee ONLY) Date [redacted]

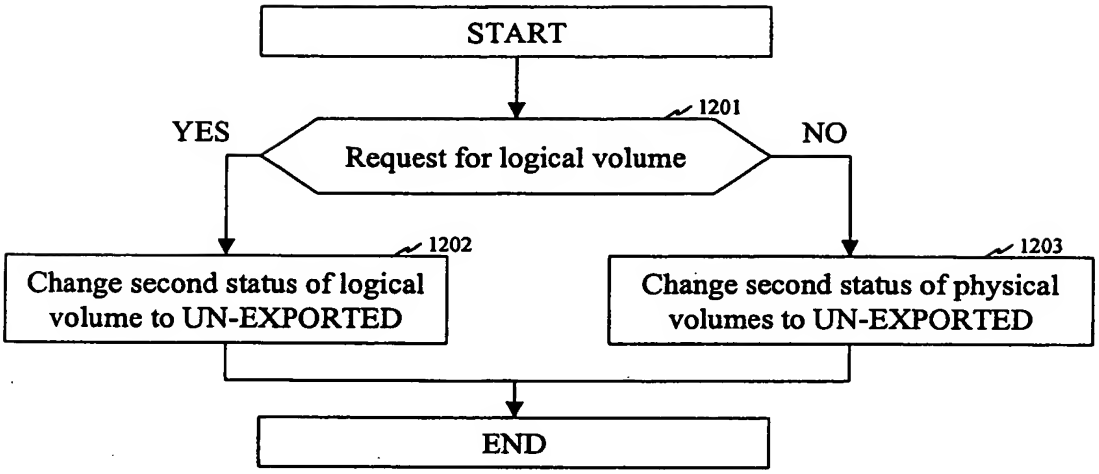

Figure 12: File-System Un-Export Procedure

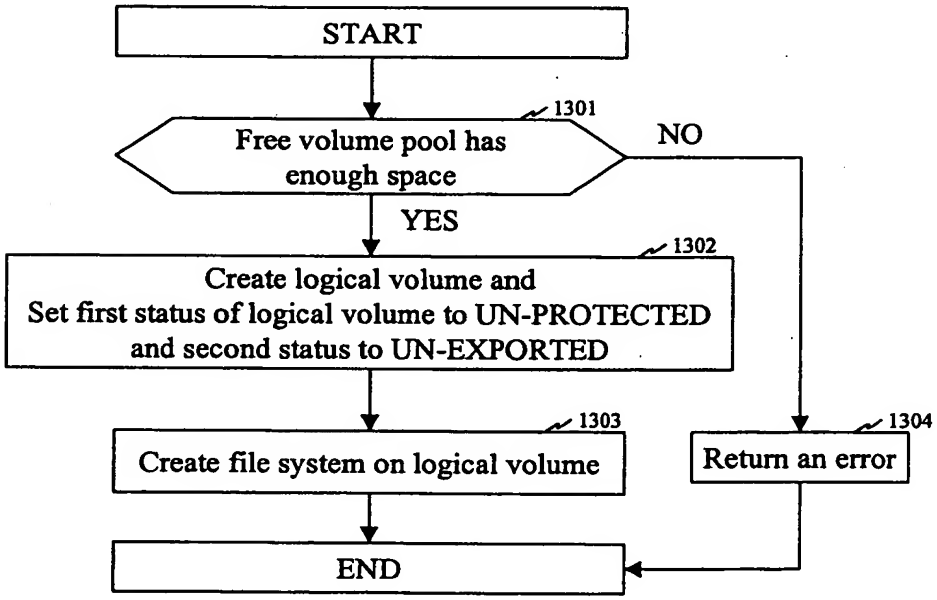

Figure 13: File-System Create Procedure

Signature of the Inventor (HAL employee ONLY) Date [redacted]	Signature of the Inventor (HAL employee ONLY) Date
Signature of the Inventor (HAL employee ONLY) Date	Signature of the Inventor (HAL employee ONLY) Date
Signature of the Witness (HAL employee ONLY) Date [redacted]	Signature of the Witness (HAL employee ONLY) Date [redacted]

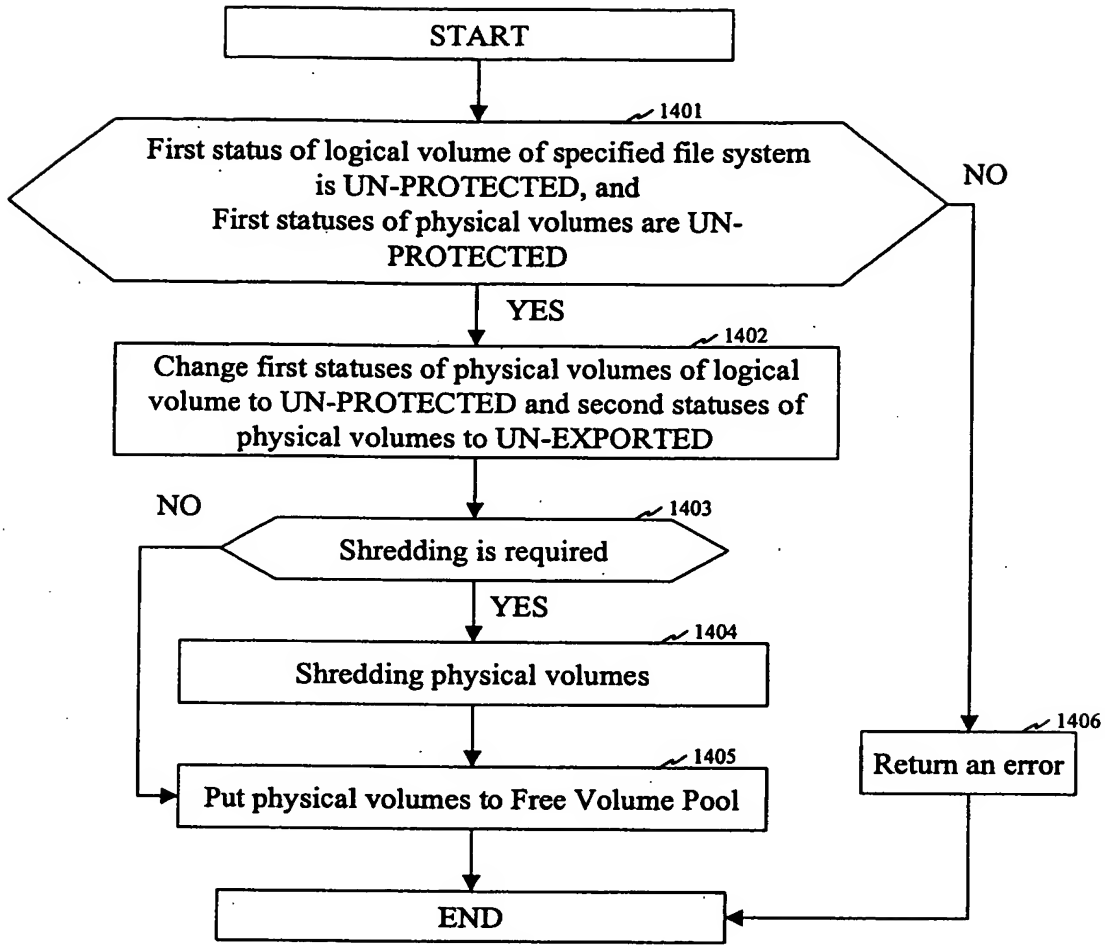

Figure 14: File-System Delete Procedure

Signature of the Inventor (HAL employee ONLY)	Date	Signature of the Inventor (HAL employee ONLY)	Date
[redacted]	[redacted]		
Signature of the Inventor (HAL employee ONLY)	Date	Signature of the Inventor (HAL employee ONLY)	Date
Signature of the Witness (HAL employee ONLY)	Date	Signature of the Witness (HAL employee ONLY)	Date
Toshi Arai	[redacted]	Takashi Nakamura	[redacted]

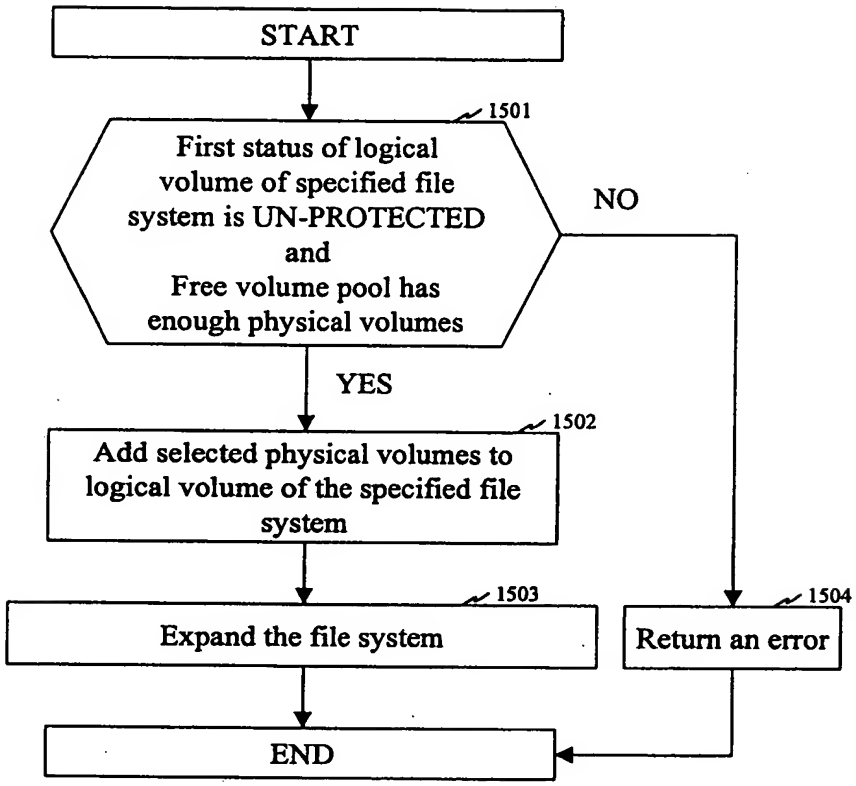

Figure 15: File-System Expand Procedure

Signature of the Inventor (HAL employee ONLY) Date [redacted]	Signature of the Inventor (HAL employee ONLY) Date
Signature of the Inventor (HAL employee ONLY) Date	Signature of the Inventor (HAL employee ONLY) Date
Signature of the Witness (HAL employee ONLY) Date [redacted]	Signature of the Witness (HAL employee ONLY) Date [redacted]

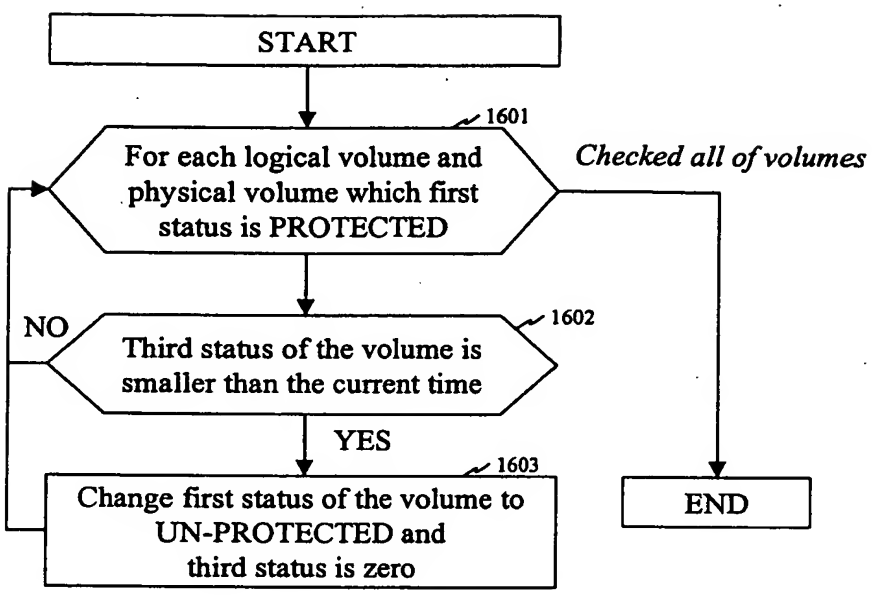

Figure 16: Expired Date Check Procedure

Signature of the Inventor (HAL employee ONLY) Date [redacted]	Signature of the Inventor (HAL employee ONLY) Date
Signature of the Inventor (HAL employee ONLY) Date	Signature of the Inventor (HAL employee ONLY) Date
Signature of the Witness (HAL employee ONLY) Date [redacted]	Signature of the Witness (HAL employee ONLY) Date [redacted] Takashi Nakamura

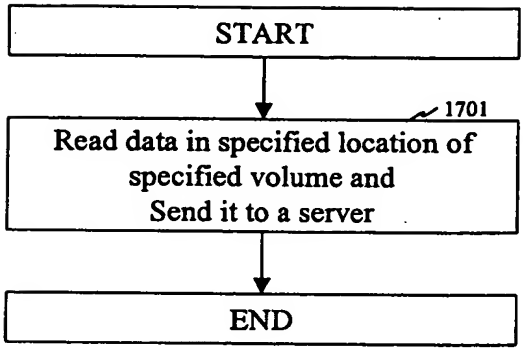

Figure 17: Data Block Read Procedure

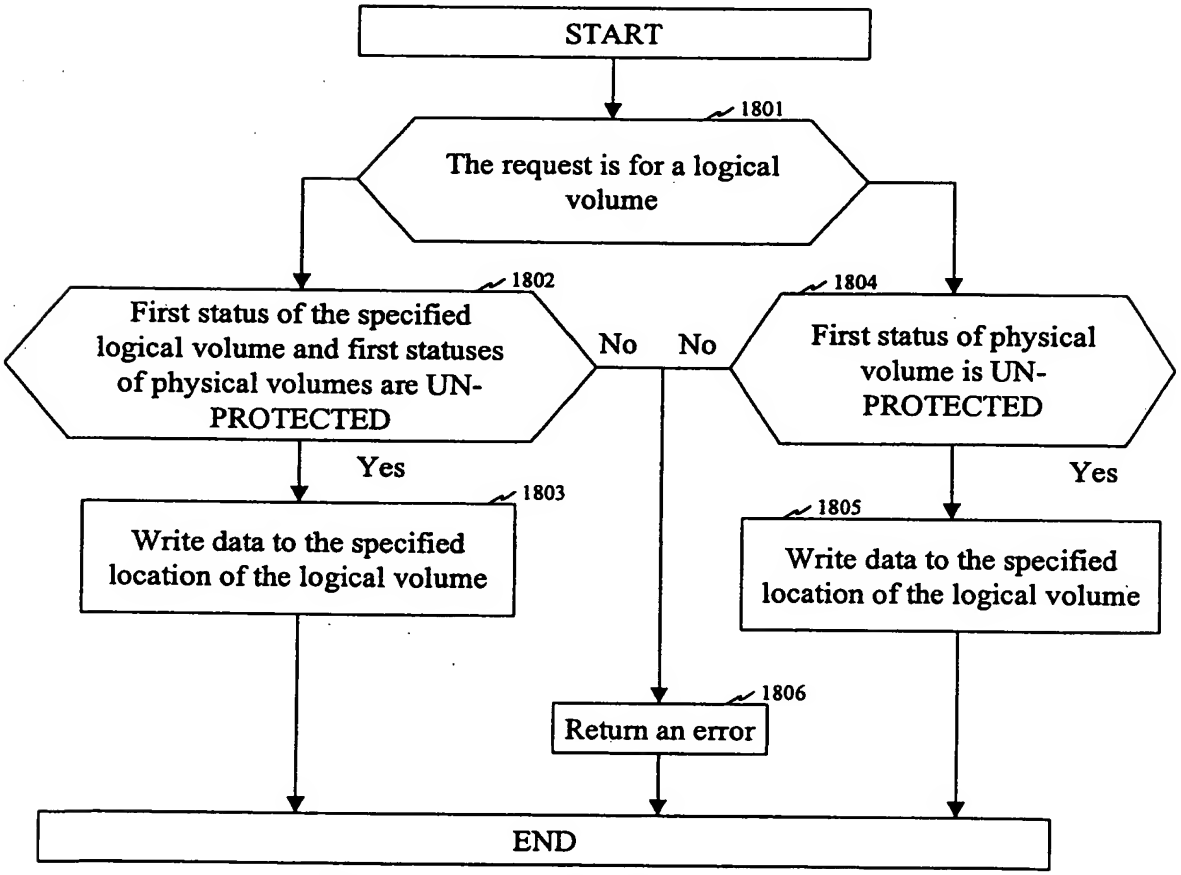

Figure 18: Data Block Write Procedure

Signature of the Inventor (HAL employee ONLY) Date [redacted]	Signature of the Inventor (HAL employee ONLY) Date
Signature of the Inventor (HAL employee ONLY) Date	Signature of the Inventor (HAL employee ONLY) Date
Signature of the Witness (HAL employee ONLY) Date [redacted]	Signature of the Witness (HAL employee ONLY) Date [redacted]

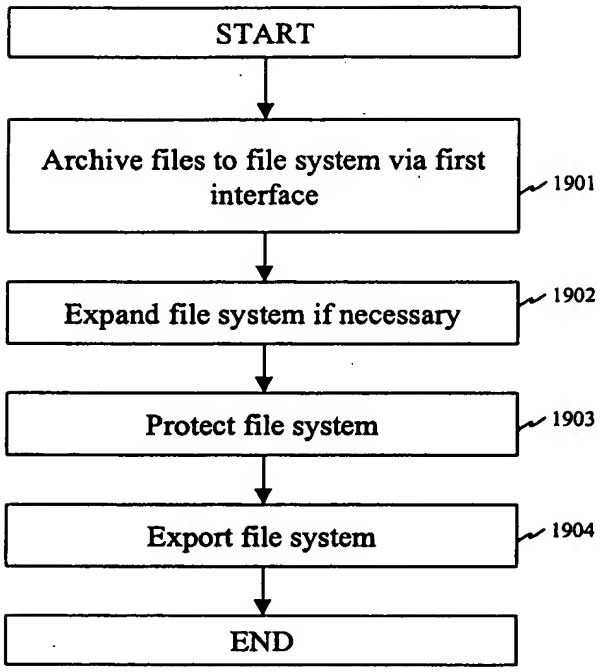

Figure 19: How to archive files (One Example)

Signature of the Inventor (HAL employee ONLY) Date [redacted]	Signature of the Inventor (HAL employee ONLY) Date
Signature of the Inventor (HAL employee ONLY) Date	Signature of the Inventor (HAL employee ONLY) Date
Signature of the Witness (HAL employee ONLY) Date [redacted]	Signature of the Witness (HAL employee ONLY) Date [redacted] Takashi Nakamura

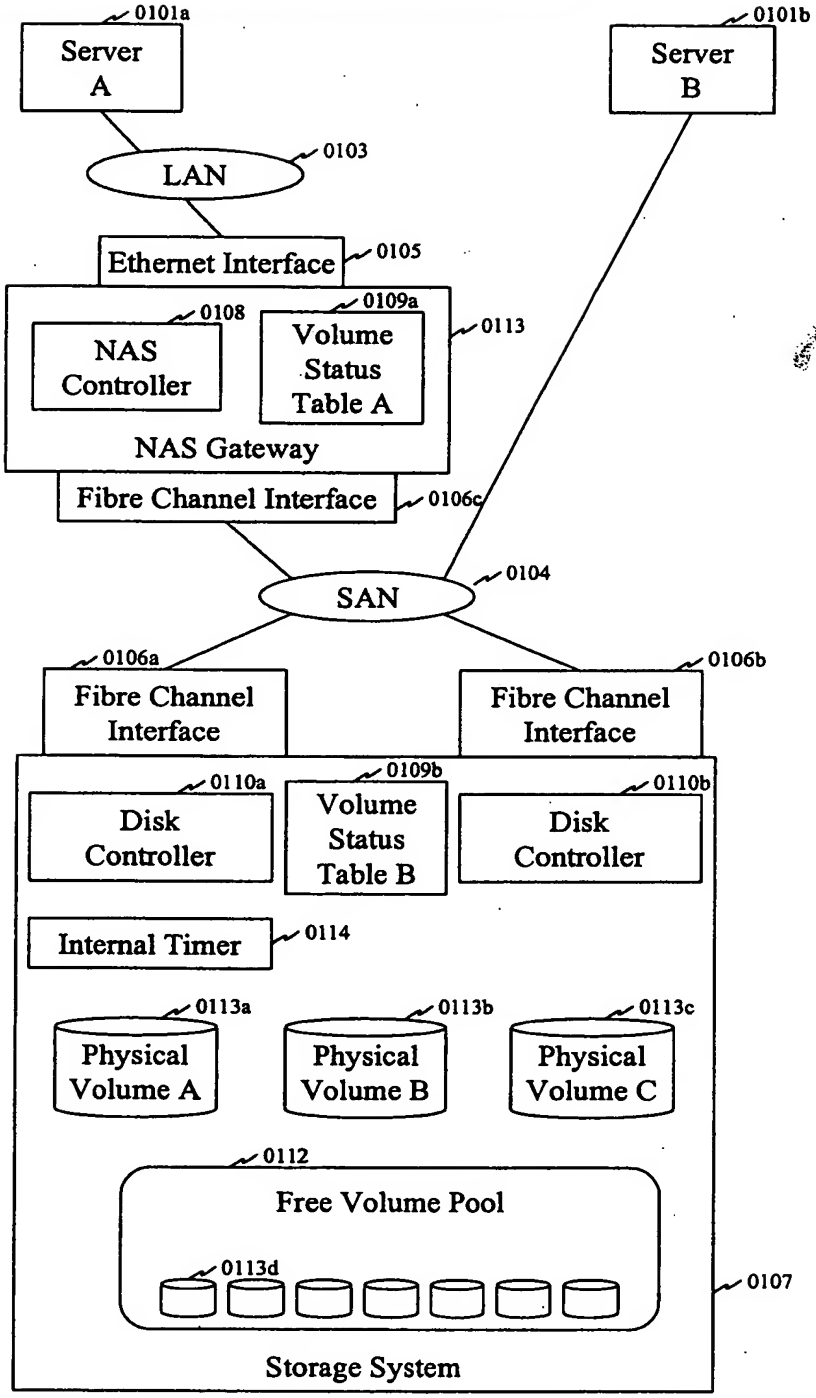

Figure 20: System Diagram

Signature of the Inventor (HAL employee ONLY) *Date* [redacted]	*Signature of the Inventor (HAL employee ONLY)* *Date*
Signature of the Inventor (HAL employee ONLY) *Date*	*Signature of the Inventor (HAL employee ONLY)* *Date*
Signature of the Witness (HAL employee ONLY) *Date* [redacted]	*Signature of the Witness (HAL employee ONLY)* *Date* [redacted]

V. Use of the Invention

Direction: Indicate one or more uses for the invention. Note all plans, if any, for exploiting the invention commercially. If the invention is used in a larger system, please briefly describe the larger system and include a figure representing the system. Also include potential future uses for the invention in 5, 10 and 15 years during the life of the patent."

Long term data retention.

*** * * * * End of the Invention Disclosure * * * * ***

Signature of the Inventor (HAL employee ONLY) *Date* [redacted]	*Signature of the Inventor (HAL employee ONLY)* *Date*
Signature of the Inventor (HAL employee ONLY) *Date*	*Signature of the Inventor (HAL employee ONLY)* *Date*
Signature of the Witness (HAL employee ONLY) *Date* [redacted]	*Signature of the Witness (HAL employee ONLY)* *Date* [redacted]